A STUDY TO ASSESS THE EFFECTIVENESS OF CINNAMON FOR LOWERING BLOOD SUGAR AMONG TYPE II DIABETES PATIENTS IN SELECTED PRIMARY HEALTH CENTERS, NAMAKKAL DISTRICT.

BY

30093602

A DISSERTATION SUBMITTED TO THE TAMILNADU Dr.M.G.R. MEDICAL UNIVERSITY, CHENNAI, IN PARTIAL FULFILMENT OF THE REQUIREMENT FOR THE AWARD OF THE DEGREE OF MASTER OF SCIENCE IN NURSING

APRIL – 2011

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"For thou art the glory of their strength:

and in thy favor our horn shall be exalted"

Psalms – 89 : 17

"Gratitude is not only the memory but also the respect of heart rendered to the person for his/her guidance and goodness"

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CHAPTER – I

INTRODUCTION

BACKGROUND OF THE STUDY

Diabetes is a chronic disease, which occurs when the pancreas does not produce enough insulin, or when the body cannot effectively use the insulin, it produces. This leads to an increased concentration of glucose in the blood (hyperglycemia).

The term "*Diabetes" was* coined by Aretaeus of Cappadocia. It was derived from the Greek verb diabaínein, Diabetes is first recorded in English, in the form diabetes, in a medical text written around 1425. In 1675, Thomas Willis added the word *mellitus*, from the Latin meaning "honey", a reference to the sweet taste of the urine.

In 1910, Sir Edward Albert Sharpey-Schafer suggested that people with diabetes were deficient in a single chemical that was normally produced by the pancreas—he proposed calling this substance *insulin.*

CLASSIFICATION

Type 1 diabetes (previously known as insulin-dependent or childhood-onset diabetes) is characterized by a lack of insulin production.

Type II diabetes (formerly called non-insulin-dependent or adult-onset diabetes) is caused by the body's ineffective use of insulin. It often results from excess body weight and physical inactivity.

Gestational diabetes is hyperglycemia that is first recognized during pregnancy.

Other forms of diabetes mellitus include:

- Congenital diabetes - which is due to genetic defects of insulin secretion.
- cystic fibrosis-related diabetes,
- steroid diabetes induced by high doses of glucocorticoids, and
- Several forms of monogenic diabetes.

World Health Organization in the year 2000, reported at least 171 million people suffer from diabetes globally (2.8% of population).The increase in incidence of diabetes in developing countries follows the trend of urbanization and lifestyle changes, perhaps most importantly a "Western-style" diet. According to the American Diabetes Association, Diabetes mellitus prevalence increases with age, and the numbers of older persons with diabetes are expected to grow as the elderly population increases in number. The National Health and Nutrition Examination Survey (NHANES III) demonstrated that, in the population over 65 years old, 18% to 20% have diabetes, with 40% having either diabetes or its precursor form of impaired glucose tolerance.

Diabetes is the single most important metabolic disease, which can affect nearly every organ system in the body. Currently the number of cases of diabetes worldwide is estimated to be around 150 million. This number is predicted to double by 2025(a prevalence rate of about 5.4 per cent) with the greatest number of cases being expected in China and India.

In India it is estimated that presently 32.7 million individuals are affected by this deadly disease, which is likely to go up to 79.5 million by the year 2025. The reasons for this

escalation are due to changes in lifestyle; people living longer than before (ageing) and low birth weight could lead to diabetes during adulthood. With India having the highest number of diabetic patients in the world. Calling "India the diabetes capital of the world", the International Journal of Diabetes in Developing Countries says that there is alarming rise in prevalence of diabetes, which has gone beyond epidemic form to a pandemic one. The International Diabetes Federation estimates that the number of diabetic patients in India more than doubled from 19 million in 1995 to 40.9 million in 2007.

It is estimated that 20 per cent of the current global diabetic population resides in the south – East Asia region. The number of diabetic person in the countries of the region is likely to triple by the year 2025, increasing from the present estimates of about 30million to 80 million. In India, the Chennai-based Diabetes Research Centre says that over 50 per cent cases of diabetes in rural India and about 30 per cent in urban areas go undiagnosed.

South – East Asia countries will become the most challenged region in the world and the region will bear the maximum global burden of the disease in the initial decades of the 21st century.

An increase in number of population use complementary and alternative medicine for health promotion and disease prevention, large numbers of families treat themselves with herbs and nutritional supplements and are not represented in the reported visits (Spigelblatt, 1997). Although exact numbers are unclear. These therapies share elements of wellness, self-healing, and healthy lifestyle. Traditional providers are incorporating complementary and alternative therapies into practice as more research showing positive effects becomes available. More than 65% to 80% of the world' population use non- western medicine for their health care. Herbal preparations are the most frequently used therapies in the world.

Cinnamon has a long history both as a spice and as a medicine. Cinnamon is the inner bark of a tropical evergreen tree native to India and Sri Lanka; it's available in its dried tubular form known as a quill or as ground powder. The benefits of cinnamon also include treating stomach disorders, diarrhea, nausea and vomiting. It acts as a digestive aid and can relieve gas and bloating. The most intriguing of all is the recently touted cinnamon diabetes treatment.

Scientists have discovered that cinnamon has insulin-like properties, which able to decrease blood glucose levels as well as triglycerides and cholesterol, all of which are important especially for type 2 diabetes patients.

NEED FOR THE STUDY

According to W.H.O estimates, by 2025 total 300 million of the worldwide population will be affected by diabetes. For every 21 seconds, someone is diagnosed with diabetes, and every 10 seconds a person dies from diabetes-related causes in the world, an estimation given by American Diabetes Association. Its incidence is increasing rapidly, and it is estimated that by 2030, this number will almost double.

Diabetes mellitus occurs throughout the world, but is more common (especially type 2) in the more developed countries. The greatest increase in prevalence is, however, expected to occur in Asia and Africa, the percentage of diabetic cases residing in urban areas is projected to increase from 54 per cent in 1995 to 73 per cent by the year2025.The increase in incidence of diabetes in developing countries follows the trend of urbanization and lifestyle changes, perhaps most importantly a "Western-style" diet.

The results of prevalence studies of diabetes mellitus in India were systematically reviewed with emphasis on those utilizing the standard WHO criteria for diabetes diagnosis.

The prevalence of disease in adult was found to be increasing. Currently, 4 to 11.6per cent of India's urban dwellers and 2.4 to 3 per cent of rural population. Potential for further rise in prevalence of diabetes mellitus in the coming decades. Diabetes affects all people in the society, not just those who live with it. These estimates are based on lost productivity, resulting primarily from premature death. Various studies have shown that the high incidence of diabetes in India is mainly because of sedentary lifestyle, lack of physical activity, obesity, stress and consumption of diets rich in fat, sugar and calories.

Each year, over three million deaths worldwide are tied directly to diabetes and even greater number die from cardiovascular disease. Modification in lifestyle and proper medication can delay and prevent diabetes in high-risk groups. Eating whole grain carbohydrates and moderate exercise and avoiding excessive weight gain could eliminate over eighty per cent of Type-2 diabetes. Diabetes related complications are coronary artery disease, peripheral vascular disease, neuropathy, retinopathy, nephropathy, etc. People with diabetes are 25 times more likely to develop blindness, 17 times more likely to develop kidney disease, 30-40 times more likely to undergo amputation, two to four times more likely to develop myocardial infarction and twice as likely to suffer a stroke as non-diabetics.

BENEFITS OF CINNAMON

A few of the herbs have proven successful as natural supplements to treat signs and symptoms of diabetes. Natural remedies such as cinnamon can be used as natural supplements to treat diabetes and support healthy circulation, which is responsible for sufficient blood flow to the extremities.

Cinnamon diabetes treatment is a very cost-effective way of offsetting health problems related to glucose/insulin imbalances. With just half a teaspoon (half a teaspoon is equivalent to one gram.) of cinnamon into the daily diet of a diabetics can significantly reduce

blood glucose levels. The effect can even be produce by soaking a cinnamon stick in you tea or coffee which can help to prevent and act against diabetes.

Scientist found that cinnamon has insulin-like effects and its active ingredient, called polyphenols can improve levels of three key proteins. Those proteins are crucial to promoting normal insulin-signaling processes, a healthy inflammatory response, and efficient glucose transportation throughout the body.

Scientific name(s): Chinese cinnamon / cassia – cinnamomum cassia

Cyclone cinnamon / canela – cinnamomum zeylanicum

OTHER ALTERNATIVE REMEDY

1. Most effective Home Remedy for Diabetes is Bitter gourd and proved helpful in controlling diabetes. For better results, the diabetic should take the juice of about four or five Bitter gourds each morning on an empty stomach.
2. Take juice of bilva and parijataka leaves in identical parts for natural remedy of diabetes.
3. Indian gooseberry, with its high vitamin C content, is measured important in diabetes. A tablespoon of its juice, mixed with a cup of bitter gourd juice, taken daily for two months, will rouse the islets of Langerhans, that is, the remote group of cells that secrete the hormone insulin in the pancreas. This mixture diminishes the blood sugar in diabetes. This is another effective Home Remedy for Diabetes.
4. The seeds of parslane are helpful in diabetes. A teaspoon of the seeds should be taken each day with half a cup of water for four to five months. It will boost the body's own insulin and help in curing diabetes.
5. Including grapefruit in the diet is an outstanding natural home remedy for diabetes.

6. Take two teaspoons of powdered Fenugreek seeds with milk. Two teaspoons of the seeds can also be consumed whole, every day.
7. The tender leaves of the mango tree are considered as good Home Remedy for Diabetes. An infusion is made by soaking 15 gm of fresh leaves in 250 ml of water overnight, and squeeze them well in the water. This filtrate should be taken every morning to handle early diabetes. As an option, the leaves should be dried in the shade, powdered and preserved for use when needed. Half a teaspoon of this powder should be taken two times a day.
8. The juice of Margosa is a cooperative natural home remedy for diabetes.
9. String bean pod tea is a superb natural Home Remedy for Diabetes and can be substituted for insulin.
10. Eat 10 fresh fully full-fledged curry leaves each morning for three months. It avoids diabetes due to genetic or heredity factors.

STATEMENT OF THE PROBLEM

A study to assess the effectiveness of cinnamon for lowering blood sugar among type II diabetes patients in selected primary health centers, Namakkal district.

OBJECTIVES

1. To evaluate the blood sugar level before and after taking cinnamon among type II diabetes patients in experimental group.
2. To compare the mean difference in blood sugar among type II diabetes patients between the experimental and control group.
3. To test the association between the mean difference in blood sugar and selected factors among type II diabetes patients.

HYPOTHESES

H_1 : There will be a significant difference between pre and post test mean blood sugar among type II diabetes patients.

H_2 : There will be a significant difference in the mean difference of blood sugar among type II diabetes patients between the experimental and control group.

H_3 : There will a significant association between the mean difference in blood sugar and selected factors among type II diabetes patients in experimental group.

DEFINITION OF TERMS

1) Effectiveness: Refers to the outcome of the cinnamon among type II diabetes patients. It is measured in terms of the difference between pre test and post test blood glucose level.

2) Cinnamon: It is a powerful spice for controlling blood glucose. It will be administered in the form of 6gram powder daily once along with breakfast.

3) Type II Diabetes Patients: Refers to those patients who were diagnosed to have type II diabetes patients whose fasting blood sugar level will be more than 120mg/dl.

4) Blood Sugar: Refers as a method for learning how much glucose in the blood sample taken in the community.

5) Selected Back ground Factors : Refers to those factors which are thought to influence the mean difference in blood sugar such as age, sex, education, marital status, occupation, income, dietary pattern, nature of work and duration of work.

ASSUMPTIONS

- ✓ TYPE II diabetes patients will participate in the study willingly.
- ✓ Tool prepared for the study would be sufficient for collecting information regarding effectiveness of cinnamon powder in maintaining the blood sugar.

DELIMITATION

The study was delimited to

- ✓ Type II DM patients attending diabetic clinic in selected primary health centers, Namakkal district.
- ✓ Sample selected by non-random method.
- ✓ Blood sugar was tested both morning (FBS) and evening (RBS).

CONCEPTUAL FRAMEWORK

A good research generally integrates research findings to an orderly, coherent system. Such integration typically involves linking new research. The orderly coherent system is termed as a set of concept.

A conceptual is made of concepts, which are mental images of a phenomenon. Those concepts are linked together to express the relationship between them. It guides the investigator to know what data needs to be collected and gives direction to the entire research process.

The evidenced based practice model explains through three concepts such as, context of care, clinical decision making and patient outcome. In the present study the context of the care was modified to explain the experimental group with intervention, control group with no intervention and background factors were included. Decision on blood sugar level was estimated on the basis of pre test and post test. The outcome was the impact of blood sugar.

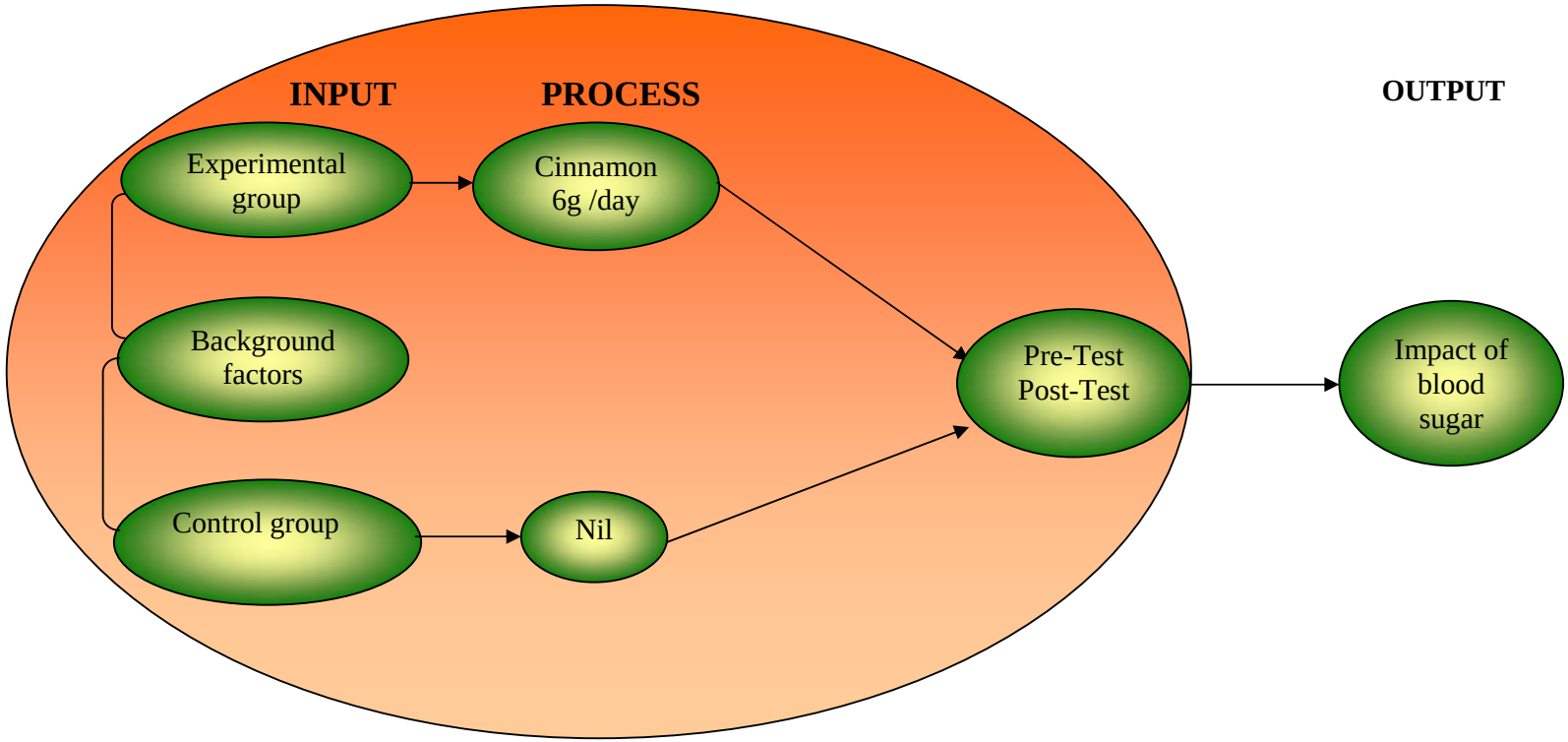

Fig 1: CONCEPTUAL FRAME WORK BASED ON EVIDENCED BASED PRACTICE, (EBP, PROCESS MODEL)

CHAPTER – II

REVIEW OF LITERATURE

The literature review is more than listing or summary of relevant research. It entails the combination of several elements or studies to provide a different or new focus on the research problem. The research community uses the term literature review in two ways. The first refers to the activity involved in identifying and searching for information on a topic and developing and undertaking the state of knowledge on that topic. Other than that, it is used to designate a written summary of the act on a search problem. Both the search and the write up are important in the research process.

An extensive review of literature was done through Medline, Internet, Journals and Textbooks and organized under the following headings.

1. Studies related to type II diabetes.
2. Studies related to type II diabetes and cinnamon.
3. Studies related to type II diabetes and Complementary and alternative therapy.

1. STUDIES RELATED TO TYPE II DIABETES

Jeanine.B., et al., (2009)., conducted an experimental study on metabolic changes following a 1 year diet and exercise intervention among patients with type II D.M.Sample size were 58(26 men and 32 women) selected randomly. Intervention was given to the participants for a period of one year, baseline and one year measurements were taken. Result shows that patients with type II D.M who were under treatment had significant improvement in fasting

glucose and adipose tissue distribution and overall overweight reduction is shows study concludes that 1 year lifestyle intervention among type II D.M patients manifested a good metabolic changes which controlled their blood sugar level and overall reduction in weight.

Kumar.S.,Singh.,Z.,et.al., (2008), conducted a study to estimate the Diabetes Prevalence and its risk factors in Rural area of Tamil Nadu. A Sample of 1936 population screened of this 769 was males and 1167 were females. In all the subjects, family history of diabetes was obtained and details on physical activities were assessed, using a validated questionnaire. A simplified Indian Diabetes risk score was used to identify high risk subjects. This is of great significance as use of such scoring system can prove to be a cost effective tool for screening of diabetes. This study concludes the usefulness of simplified Indian Diabetes risk Score for Indentify high risk diabetes subjects in the Community. Use of the IDRS can make more screening for diabetes in Indian more cost effective.

Pederson.S.D., Kang.J., and Kline.G.A.,(2007) conducted a study to evaluate the efficacy of portion control plate for weight loss in obese patients with type II diabetes. Sample size was 130 and was randomly assigned as experimental and control group. Experimental group used portion control plate and control group were on usual care for 6months period. Results explored that the interventional group reduced more weight than control. The portion control plate among diabetes patients had a reduction in hypoglycemic medications.

Jan Erik Henriksen., Et.All (2003)., conducted a study to assess the combined effect of Triple Therapy With Rosiglitazone, Metformin, and Insulin Aspart in Type 2 Diabetic Patients. Sixteen obese type 2 diabetic outpatients on human NPH or MIX (regular + NPH insulin) insulin twice daily were randomized to either triple therapy, i.e., insulin as part (a rapid-acting insulin analog) at meals, metformin (which improves hepatic insulin sensitivity), and rosiglitazone (which improves peripheral insulin sensitivity), or to continue their NPH or MIX insulin twice

daily for 6 months. Insulin doses were adjusted in both groups based on algorithms. HbA_{1c}, insulin dose, hypoglycemic episodes, insulin sensitivity (clamp), hepatic glucose production (tracer), and diurnal profiles of plasma glucose and insulin were used in evaluating treatment. Results shows that In the triple therapy group, HbA_{1c} declined from 8.8 to 6.8% ($P < 0.01$) without inducing severe hypoglycemic events. Postprandial hyperglycemia was generally avoided, and the diurnal profile of serum insulin showed fast and high peaks without any need to increase insulin dose. In the control group, the insulin dose was increased by 50%, but nevertheless both HbA_{1c} and 24-h blood glucose profiles remained unchanged. Insulin sensitivity improved in both skeletal muscle and the liver in the triple therapy group, whereas no change was observed in the control group.

Stuwart .W.,Shu-Lin .C.,Ionet.A. and,William.H., (2003) conducted a study to find the effect of inhaled insulin in glysemic control among Type II diabetes patients. Sample size was 68 patients with diabetes mellitus, randomly selected. Experimental group n=32 were given inhaled insulin (dose 1 to 2 inhalations of 1mg or 3 mg) along with oral antidiabetic agents and control group(n=36)were given only oral antidiabetic agent for a period of 12 weeks. Results shows a higher mean reduction in glucose level (p<.001).Study concludes that inhaled insulin has a good effect in reduction of glycemic control.

Anderson.G., (2002), conducted a study to determine whether diabetes education can be provided effectively through telemedicine technology. A total of 56 adults were selected by randomly, and educated via telemedicine (telemedicine group) and in person (control group). The education consisted of three consultative visits with diabetes nurse and nutrition educators. The in-person and telemedicine groups were compared using measures of glycemic control (HbA_{1c}) and questionnaires to assess patient satisfaction and psychosocial functioning as related to diabetes. Outcome measures were obtained at baseline, immediately after the completion of diabetes education, and 3 months after the third educational visit.Result shows

that Patient satisfaction was high in the telemedicine group. Problem Areas in Diabetes scale scores improved significantly with diabetes education (adjusted $P < 0.05$, before vs. immediately after education and 3 months after education), and the attainment of behavior-change goals did not differ between groups. With diabetes education, HbA_{1c} improved from 8.6 ± 1.8% at baseline to 7.8 ± 1.5% immediately after education and 7.8 ± 1.8% 3 months after the third educational visit (unadjusted $P < 0.001$, $P = 0.089$ adjusted for BMI and age), with similar changes observed in the telemedicine and in-person groups.

Karin.M.,Gayle.R., and Edward .B.,(2002), conducted an experimental study to describe diet and exercise practice among type II diabetes patient in United States. A sample of 1,480 type II diabetes patients was selected. Results shows that majority of individuals were overweight, did not practice the recommended physical activity and dietary guidance. Study concluded that a constant encouragement on regular physical activity and dietary habits to control the glycemic effect.

2. STUDIES RELATED TO TYPE II DIABETES AND COMPLEMENTARY AND ALTERNATIVE THERAPY.

Nahas.R., and Moher.M.,(2009) reviewed Clinical evidence supporting complementary and alternative medicine for improving gycemic control in typeII Diabetes. The data were collected from MEDLINE and EMBASE for the period of January 1966 to August 2008. Therapies used in the treatment are Cinnamon, fenugreek and Green tea on human trials were used. Results show that Cinnamon improved fasting blood sugar. Green tea and fenugreek reduced FBS level. Investigator suggested further research in Cinnamon.

Yeh.G.Y., Elsenberg.D.M., Kaptechuk.T.J., and Phillips.R.S.,(2003) conducted a systematic review of herbs and dietary supplements for glycemic control in diabetes. Published literature on herbal therapies and vitamin, mineral supplements for glycemic control among diabetes patients were included. Data collected from MEDLINE, OLDMEDLINE and Cochrane Library Database and Health star (May 2002).A total of 108 trials, of 3 patients 6 herbs and vitamin and minerals supplements among 4,565 patients with diabetes were analyzed. Results showed that maximum number of participants were type II diabetes and improved glucose control was obtained on 76% of the study participants.

3. STUDIES RELATED TO TYPE II DIABETES AND CINNAMON

Steve.M.,Misti.J.,Jonella .W.,Robert.H.and Christofer.E.,(2009) A total sample was 77 out of this 43 completed the study. Samples were selected randomly. Trial group were administered 500mg of cinnamon capsules along with daily breakfast and dinner for 3 months. Results show that there was a minimal effect in reduction of fasting glucose and lipid level among type II D.M.patients.

Kirkan.S.,Akilen.R.,Sharma.S.,and Tsiamitt(2008) examined the potential of cinnamon to reduce blood glucose level in patients with type II diabetes and insulin resistance in Brent Ford .U.K.A systematic electronic search using the medical subject headings cinnamon and blood glucose was carried out to include randomized, placebo-controlled in vivo clinical trials by using cinnamon conducted between Januarry2003 and 2008.Result revealed that 5 type II diabetic studies (Total n= 311)were eligible ,studies reported that reduction in fasting blood glucose level. Study concludes cinnamon as an antibiotic therapy, it does possess anti hyperglycemic properties.

Chane.C.K.,and Queen.C.E.,(2007) Conducted a study to assess the effectiveness of cinnamon extract in reduction of HbA1C among type II D.M,Germany.A total sample of 65 were selected. Experimental group were given 112 gm aqueous cinnamon extract and placebo were given to control group three times a day along with meals for 4 months. The mean HbA1C was not declined among experimental group, were as fasting blood glucose declined among experimental group. Study concluded that the agues extract of cinnamon has shown the effect in reducing fasting blood glucose among type II D.M patients.

Hlebowicz.J.,and Darwiche.G.,(2007) conducted a study on effect of cinnamon on postprandial blood glucose, Sweden. A sample of 14 healthy subjects was answered by using a cross over trial. Participants were given 300gms of rice pudding and 6gms of cinnamon. Result shows that postpandrium glucose response ($p<.05$).The study concludes that administration of 6gms cinnamon along with rice pudding reduced post pan trial blood glucose and it was highly noticeable. There for cinnamon in the diet lowers the blood glucose level.

Mike.O., Las .V.,and Paul.C.,(2007) conducted a study on effectiveness of cinnamon for lowering hemoglobin A1C in patients with type II diabetes patients randomly selected from 3 primary care clinics. Experimental group received cinnamon capsules (1gm) per day plus usual care for 10 days.HbA1C was drawn at baseline and compared with post test HbA1C level, other group received only usual care. Results shows that cinnamon lowered HbA1C 0.83% compared with usual care alone HbA1C 0.37% study concludes that intake of cinnamon is useful for reducing the HbA1C in type II diabetes.

Khan.A.,Safdar.m.,Alikhan.M.M.,Khatta.k.n.and Anderson.R.A.,(2003), conducted a study to identify the effect of cinnamon in improving blood glucose among type II diabetes in Pakisthan.A total sample of 60 were selected among which 30 men and 30 women between the age group of 45-60 years. Random sampling was done. Experimental group received 6

grams of cinnamon capsule daily, and control group were given placebo capsule, for a period of 40 days which was followed by a wash out period of 20 days. Results indicated that cinnamon has shown a reduction in mean fasting glucose, 234-166(18-29%) level and no significant changes were seen among control group. Study concluded that administration of 6grams cinnamon per day has reduced blood glucose level among type II diabetes patient.

Mang.B.,et al,(2000), conducted a study on effects of cinnamon extract in reducing of fasting glucose among type II diabetes patients, in Germany. Total samples of 79 type II diabetes patients were randomly selected. Experimental group were given 3gms of cinnamon per day and control group was given placebo capsule for about 4 months in a double blind study. Results shows that the mean percentage between the pre and post fasting blood glucose level were highly significant between experimental groups (10.3%) than the control group (3.4), no adverse effect were observed among cinnamon group. Study concludes that 3 gram of cinnamon per day has an effect is reduction of F.B.S.glucose among poor glycemic control patients of type II D.M.

CHAPTER – III

METHODOLOGY

The study conducted was an evaluative study on blood sugar among type II diabetes patient in relation to cinnamon in selected primary health center, Namakkal district.

This chapter deals with description of the steps, undertaken by the researcher for the study. It includes the research approach, research design, variables, settings, population, sample size, sample technique, sample criteria, development of tool, description of the tool content validity, reliability, pilot study, data collection procedure, plan for data analysis and ethical issues.

RESEARCH APPROCH

Research that explores the interrelationship among variables of interest with intervention on the part of the researcher is an experimental study. Quasi–experiments, like true experiments, involve the manipulation of an independent variable, that is, an intervention. Quasi-experimental designs lack randomization to treatment groups, which characterizes true experiments. The most frequently used quasi-experimental design is nonequivalent control group pretest-posttest design, which involves an experimental treatment and two groups of subjects observed before and after its implementation. In the present study the investigator intended to assess the effect of cinnamon in lowering blood sugar among typeII diabetes patients. A quasi- experimental design was used to answer the research question. To be precise, a nonequivalent control group pretest posttest repeated measure time series design was used in the study.

RESEARCH DESIGN NOTATION

E	:	O_1 O'_1 x O_2 O'_2 x O_3 O'_3 x O_4 O'_4
C	:	O_5 O'_5 - O_6 O'_6 - O_7 O'_7 - O_8 O'_8

E	:	Experimental Group
C	:	Control Group
X	:	Intervention (Cinnamon Powder 6g)
-	:	No intervention
O_1, O_5	:	Pre test (FBS) in experimental and control group respectively
O'_1, O'_5	:	Pre test (RBS) in experimental and control group respectively
O_2, O_3, O_7, O_4, O_8	:	Post test (FBS) in experimental and control group respectively
O'_2, O'_3, O'_7, O'_4, O'_8	:	Post test (RBS) in experimental and control group respectively

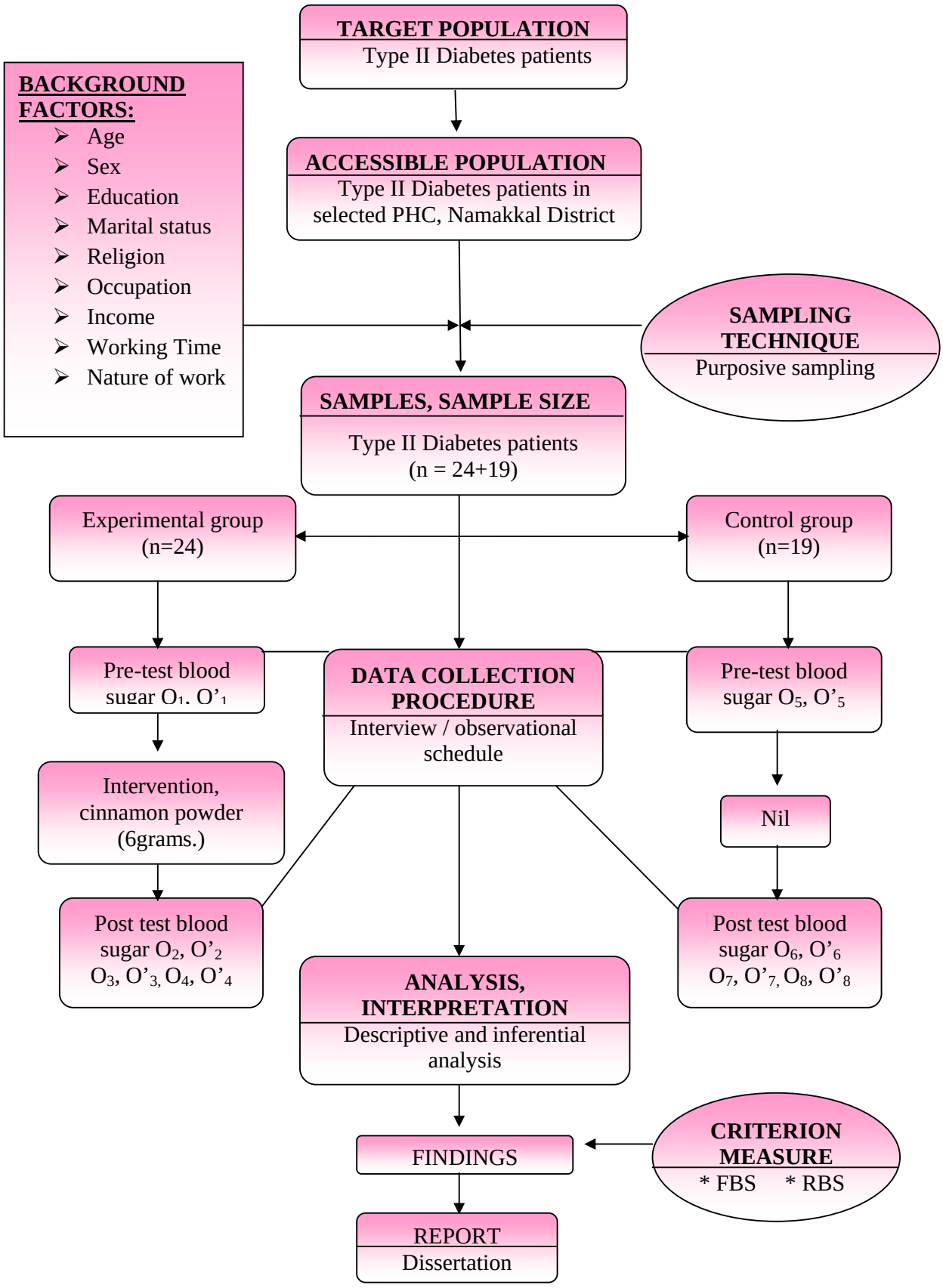

Fig: 2 SCHEMATIC REPRESENTATION OF RESEARCH DESING

VARIABLES

Variables included in the study were,

Independent Variable	:	Cinnamon
Dependent Variable	:	Blood sugar
Background Variable	:	Age, sex, education, occupation, income, marital status, working time, nature of work

SETTING OF THE STUDY

Research settings are the specific places where data collection takes place. The settings was selected based on acquaintance of the investigator with the community, feasibility of conducting the study, availability of subjects, co-operation from authorities, and proximity of setting to the investigator. The settings for the study were the houses of type II diabetes patients who attended the 2 selected primary health centers Namakkal district.

POPULATION

The target populations for the study were the type II diabetes patients and accessible population were the type II diabetes mellitus patients in selected PHC, Namakkal district.

SAMPLE AND SAMPLE SIZE

The samples for the present study were the type II diabetes mellitus patients in selected PHC Namakkal district who fulfilled the sample criteria. The main purpose of the study was to obtain large enough sample to show statistical significance and economical at the same

time. Seventy-five type II diabetes patients were recruited in the study. However with an attrition of 32 patients the effective sample size was 43, among which 24 were experimental group and 19 were control group.

SAMPLING TECHNIQUE

Sampling is an important step in the research process. Sampling is the process of selecting a portion of the population to represent the entire population. In this study purposive sampling was used to select the subjects.

SAMPLING CRITERIA

a) Inclusion Criteria

The inclusion criteria:

- Who were diagnosed to have type II diabetes.
- Patients with regular or irregular treatment.
- Whose RBS level of 125mg/dl and above
- Age group 40 years and above.
- Both male and female.
- Who could understand and speak Tamil.
- Who were taking any home remedy for type II diabetes other than cinnamon.

b) Exclusion Criteria

The exclusion criteria:

- Who were diagnosed to have type I diabetes.
- Who had other physical illness or complications.
- Who refuse to participate in this study.

DESCRIPTION OF THE TOOL

The tool used in this study was an interview and observational schedule to collect data regarding blood sugar and cinnamon among type II diabetes patients. They were 3 sections with a total of 24 items.

1. SECTION A: Background Factors
2. SECTION B: Health Factors
3. SECTION C: Observational chart on blood sugar

SECTION A: Background Factors: It contained 10 items seeking information regarding background factors like age, gender, marital status, family, education, occupation, income, working time, nature of work.

SECTION B: Health Factors: It contained 14 items seeking information regarding health factors like duration of diabetes mellitus, family history of DM, bad habits, medications used, treatment for DM, blood sugar level, diabetic diet, dietary habits, sleeping hours, exercise, home remedies and mental stress.

SECTION C: Observational chart on blood sugar: The instrument used was a glucometer and observational chart for both morning and evening (FBS & RBS) before and after administration of cinnamon. The observation recorded in the chart.

VALIDITY OF THE TOOL

The structured questionnaire schedule constructed by the investigator was sent along with the request for validation to 3 nursing experts, one general physician, and one endocrinologist. Suggestions were considered and modification of tool was done according to the opinion of experts. Translation of tool (Tamil) was done by language experts and retranslation to English was done and validity was confirmed.

VALIDITY OF THE INSTRUMENT

The glucometer was validated by comparing the blood sugar level of 5 patients with the glucometer available in the PHC and found to be reliable.

RELIABILITY OF THE TOOL

Reliability of the present study was done through inter-rater method. Ten samples were chosen from a setting similar to the research setting and the reliability value was computed through Karl Pearson's correlation was found to be r = 0.90. The tool was found to be highly reliable. The reliability coefficient of the glucometer was r = 0.96.

PILOT STUDY

In the present study the pilot study was conducted in similar setting in Namakkal district. After obtaining informed consent from the participants, a pilot study was conducted among 10 type II DM patients. Background factors and health factors were collected by interview method. The study was found to be feasible in terms of availability of samples, co-operation of the patients, time, distance, money and material.

DATA COLLECTION PROCEDURE

The data on blood sugar level was collected from type II Dm patients. The data was collected for 3 weeks in the month of October 6.10.2010 to 31.10.2010.prior permission was sort and obtained from authorities of PHC. Subjects were selected by using purposive sampling method among those who fulfilled the sampling criteria. Initial rapport was established and the purpose of study was explained to them. Informed consent was obtained from each participant.

An interview was conducted to collect the background and health factors. Pre-test blood sugar level was checked among experimental and control group, both morning and evening. Intervention was given to the experimental group by administering 6grams/day of cinnamon powder for 25 days. Regularity of intake was ascertained by the investigator personally. Post test blood sugar level was obtained on every 8th, 15th and 22nd day both morning and evening among experimental and control group. At the end tool was edited for its completion.

PLAN FOR DATA ANALYSIS

The data collected from the subjects were edited, compared and analyzed by using both descriptive and inferential statistical analysis on the basis of objectives and hypothesis of the study. The analysis was done using the statistical package (SPSS) version 17. The probability of less than 0.05 which was considered to be significant. The data were analyzed as follows.

1. Background factors of type II diabetes patients in experimental and control group were analyzed using descriptive statistic and chi-square.
2. Data on blood sugar level before and after administering cinnamon powder among type II diabetes patient in experimental group was analyzed using paired 't' test.
3. Data on mean difference in blood sugar among type II diabetes patient in experimental and control group was analyzed using unpaired 't' test.
4. Data on association between the mean difference and the selected factors was analyzed using F / t value.

ETHICAL CONSIDERATION

The research problem, objectives, intervention and data collection procedure were approved by the research committee. Informed consent was obtained from the type II DM patients. The purpose of the study was explained. The individual participants had the right to walk away from the study without assigning any reason to the investigator. No physical or psychological pain was caused .Thus ethical issues ensured in the study.

CHAPTER – IV

ANALYSIS AND INTERPRETATION

This chapter deals with analysis and interpretation of data collected on blood sugar among type II diabetes mellitus patients. Analysis of data was done using SPSS package, version 17. A probability value, less than .05 was considered to be significant.

OBJECTIVES

1. To evaluate the blood sugar level before and after taking cinnamon among type II diabetes patients in experimental group.
2. To compare the mean difference in blood sugar among type II diabetes patients between the experimental and control group.
3. To test the association between the mean difference in blood sugar and selected factors among type II diabetes patients in experimental group.

The collected data were edited tabulated, analyzed and the findings were presented in the form of tables and diagrams under the following sections.

Section I : Data on background factors of type II diabetes patients.

Section II : Data on blood sugar level before and after administering cinnamon among type II diabetes patient in experimental group.

Section III : Data on mean difference in blood sugar among type II diabetes patients in experimental group and control group.

Section IV : Data on association between the mean differences in type II diabetes patients and background variables among the patients in experimental group.

SECTION – I: DATA ON BACKGROUND FACTORS OF TYPE II DIABETES PATIENTS

TABLE – 1

Frequency, Percentage and chi square distribution of background factors among experimental and control group.

Background Variables	Experimental group (n=24)		Control group (n=19)		χ^2
	No	%	No	%	
Age					
40-45yrs	4	16.7	1	5.3	2.1
46-50yrs	2	8.3	1	5.3	P=.548
51-55yrs	5	20.8	3	15.8	(NS)
>56yrs	13	54.2	14	73.7	
Gender					.029
Male	12	50	9	47.4	P=.864
Female	12	50	10	52.6	(NS)
Marital status					1.3
Married	21	87.5	14	73.7	P=.248
Widow/widower	3	12.5	5	26.3	(NS)
Religion					
Hindu	24	100	19	100	NA
Type of family					
Nuclear	17	70.8	12	63.2	2.65
Joint	2	8.3	7	36.8	P=.26
Extended	5	20.8	0	0	(NS)

Background Variables	Experimental group (n=24)		Control group (n=19)		χ^2
	No	%	No	%	
Educational status					
Nonformal	9	37.5	10	52.6	2.2
Primary	13	54.2	9	47.4	P=.52
Higher secondary	1	4.2	0	-	(NS)
Graduate and above	1	4.2	0	-	
Annual Income					
Weaker section	8	33.3	5	26.3	1.84
Low income	11	45.8	12	63.2	P=.605
Middle income	4	16.7	2	10.5	(NS)
High income	1	4.2	0	0	
Occupational status					
Employed	7	29.2	1	5.3	4.31
Unemployed	3	12.5	2	10.5	P=.116
Self employed	14	58.3	16	84.2	(NS)
How demanding is your job					7.05
Physically	13	54.2	16	84.2	P=.029
Psychologically	0	0	1	5.3	(S)
Both	11	45.8	2	10.5	
Working time					
Less than 8hrs	8	33.3	2	10.5	12.6
8 hrs	7	29.2	17	89.5	P=.002
More than 8hrs	9	37.5	0	0	(S)

Table 1 shows the frequency, percentage and chi square distribution of background factors among experimental and control group.

Regarding the age, majority of type II DM patients 13 (54.2%) were in the age group of above 56 years in experimental group. In control group majority of patients 14(73.7%) were in the age group of above 56 years. The obtained chisquare value $\chi 2 = 2.1$ (P=.548) was not significant.

Regarding gender, majority 12 (50%) were in experimental group. In control group majority were female 10(52.6%). The obtained chisquare value $\chi 2 = .029$ (P=.86) was not significant.

Regarding marital status, majority 21(87.5%), 14(73.7%) were married in both experimental and control group respectively. The obtained chisquare value $\chi 2 = 1.3$(p=.25) was not significant.

Regarding type of family, majority 17(70.8%), 12 (63.2%) belonged to nuclear family both in experimental and control group respectively. The obtained chisquare value $\chi 2 = 2.65$(.26) was not significant.

Regarding educational status, majority 13(54.2%) had primary school in experimental group in control group majority 10 (52.6%) had nonformal education. The obtained chisquare value $\chi 2 = 2.2$(p=.52) was not significant.

Regarding income per month, majority 11(45.8%), 12(63.2%) belonged to low income group in both experimental and control group respectively. The obtained chisquare value $\chi 2 = 1.84$(p=.60) was not significant.

Regarding occupation, majority 14(58.3%), 16(84.2%) were belongs to self employed in both experimental and control group respectively. The obtained chisquare value $\chi 2 = 7.05$(p=.029) which was significant.

Regarding the nature of job, majority 13(54.2%), 16(84.2%) reported their job was physically demanding in both experimental and control group respectively. The obtained chisquare value $\chi 2=7.05(p=.029)$ which was significant.

Regarding the duration of working time, majority 9(37.5%) were working more than 8 hours in experimental group and majority 17(87.5%) were working for 8 hours in control group. The obtained chisquare value $\chi 2=12.6(p=.002)$ which was significant.

It was inferred that the type II patients in experimental and control group were comparable in all background factors expect the demand on job and working time.

SECTION - II: DATA ON BLOOD SUGAR LEVEL BEFORE AND AFTER ADMINISTERING CINNAMON AMONG TYPE II DIABETES PATIENT IN EXPERIMENTAL GROUP.

TABLE – 2

Mean, range, SD, mean difference and 't' value regarding pre test and post test blood sugar among Type II patient in experimental group

Test	Blood Sugar of Experimental Group									
	Mean		Range		SD		Mean Difference		't'	
	FBS	RBS	FBS	RBS	FBS	RBS	FBS	RBS	FBS	RBS
Pre Test	140.54	178.75	184	241	46.22	65.91	20.94	35.68	3.5 P=.002 (S)	4.04 P=.001 (S)
Post Test	119.59	143.06	74.67	108.33	22.25	27.65				

Table 2 shows the mean, range, SD, mean difference and't' value regarding pre test and post test blood sugar among Type II diabetes patient in experimental group.

The mean post test FBS (m=119.59) was less than the mean pre test FBS (m=140.5).There was a significant reduction in FBS after cinnamon administration, t= 3.5 ($p < .05$)

The mean post test RBS (143.06) was less than the mean pre test RBS (178.75). There was a significant reduction in RBS after cinnamon administration, $t = 4.04$ ($p<.05$)

It was inferred that the blood sugar had significantly reduced after administering cinnamon among type II diabetes patient in experimental group. Cinnamon was found to be effective.

SECTION III: DATA ON MEAN DIFFERENCE IN BLOOD SUGAR AMONG TYPE II DIABETES PATIENTS IN EXPERIMENTAL GROUP AND CONTROL GROUP.

TABLE – 3

SD, difference in mean difference and 't' value regarding post test blood sugar among type II diabetes patients in experimental group and control group.

Group	Post test blood sugar level					
	Mean Difference in blood sugar		Difference in mean difference		't'	
	FBS	RBS	FBS	RBS	FBS	RBS
Experimental Group (n=24)	21 (29.5)	35.7 (43.2)	-8.8	-5.8	.986 p=.330 (NS)	-.458 P=.645 (NS)
Control Group (n=19)	29.7 (28.7)	29.8 (38.5)				

Table 3 reveals the SD, difference in mean difference and 't' value regarding post test blood sugar among type II diabetes mellitus in experimental group and control group.

The difference in mean difference in FBS among control group was more 29.7 (28.7) than the experimental group 21 (29.5). The mean difference in RBS among experimental group was more 35.7 (43.2) than the control group 29.8 (38.5).There was no significant difference in the mean difference of FBS and RBS between experimental and control group. FBS t=.986 (p>.05) and RBS t=.-458 (p>.05). Therefore the null hypothesis was accepted.

It was inferred that there was no significant difference in mean difference of blood sugar between experimental group and control group. Therefore the reduction in blood sugar in experimental group is not significant due to cinnamon administration.

SECTION – IV: DATA ON ASSOCIATION BETWEEN THE MEAN DIFFERENCE IN TYPE II DIABETES PATIENTS AND BACKGROUND VARIABLES AMONG THE EXPERIMENTAL GROUP.

TABLE – 4

Data regarding mean difference in type II diabetes patients and background variables among the experimental group.

Background Variables	FBS F / t	FBS (p=.05)	RBS F / t	RBS (p =.05)
Age	1.54	.234 (NS)	.392	.760 (NS)
Sex	.677	.419 (NS)	.331	.571 (NS)
Education	.627	.606 (NS)	.202	.894 (NS)
Marital status	.647	.430 (NS)	.349	.561 (NS)
Religion	NA	NA	NA	NA
Occupation	2.50	.106 (NS)	.857	.439 (NS)
Income	.997	.414 (NS)	.431	.733 (NS)
Working Time	.350	.709 (NS)	.101	.904 (NS)
Nature of work	.215	.647 (NS)	.699	.412 (NS)

NS = Non-Significant

Table 4 reveals the data regarding mean difference in type II diabetes patients and background variables among the patient in experimental group.

None of the background variables was associated with the reduction in blood sugar among experimental group ($p > .05$).

Therefore it was inferred that the reduction in blood sugar was independent 0f background factors in experimental.

CHAPTER – V

SUMMARY, FINDINGS, DISCUSSIONS, IMPLICATIONS, LIMITATIONS, RECOMMENDATIONS AND CONCLUSION

The essence of any research projects lies on reporting the findings. This present study including conclusions, drawn from the findings, recommendations, limitations of the study, suggestions for further studies and nursing education.

SUMMARY

The main aim of the study was to find the effectiveness of cinnamon in lowering the blood sugar among type II diabetes patients in selected primary health centers, Namakkal district.

Main objectives of the study were,

1. To evaluate the blood sugar level before and after taking cinnamon among type II diabetes patients in experimental group.
2. To compare the mean difference in blood sugar among type II diabetes patients between the experimental and control group.
3. To test the association between the mean difference in blood sugar and selected factors among type II diabetes patients in experimental group.

The study attempted to examine the following research hypothesis

H_1 : There will be a significant difference between pre and post test mean blood sugar among type II diabetes patients in experimental group.

H_2 : There will be a significant difference in the mean difference of blood sugar among type II diabetes patients between the experimental and control group.

H_3 : There will a significant association between the mean difference in blood sugar and selected factors among type II diabetes patients in experimental group.

A review of related literature enabled the investigator to develop the conceptual framework, tool, methodology, which is the corner stone of this study.

Literature review was done for the present study was organized under the following headings. (1) Studies related to type II diabetes, (2) Studies related to type II diabetes and cinnamon, (3) Studies related to type II diabetes and complementary and alternative therapy.

The investigator developed a conceptual framework based on evidenced based practice model (EBP). The research design adopted for the study was a quasi experimental design. Setting chosen to conduct the study was selected primary health center in Namakkal district. The target population in the study was type II diabetes patients.

In this study the sample size was 43 type II diabetes patients. The sampling technique used in this study was purposive sampling technique. Interview was conducted to collect information on background and health factors among type II diabetes patients.

The tool developed and used for data collection was a structured interview and observation schedule. It was validated by 3 nursing experts, one general Physician, and one Endocrinologist. The reliability of the present study was done through inter-rater method (r= 0.09). The instrument reliability was 0.96. The tool was found to be highly reliable.

The pilot study was conducted in similar setting in Namakkal district. After obtaining informed consent from the participants, a pilot study was conducted among 10 type II diabetes patients.

The main study was conducted in selected PHC Namakkal district. Subjects were selected by using purposive sampling method among those who fulfill the sampling criteria. Initial rapport was established and the purpose of study was explained to them. Informed consent was obtained from each participant. An interview was conducted to collect the background and health factors. Pre-test blood sugar level was checked among experimental and control group, both morning and evening. Intervention was given to the experimental group by administering 6grams/day of cinnamon powder for 25 days. Regularity of intake was ascertained by the investigator personally.post test blood sugar level was obtained on 8th , 15th and 22nd day after the pre test, both morning and evening among experimental and control group. The data collected from the subjects were edited, compared and analyzed by using both descriptive and inferential statistical analysis on the basis of objectives and hypothesis of the study.

CHARACTERISTCS OF THE STUDY

Majority of the patients in the experimental group were in the age group of above 56 years 13 (54.2%); belonged to females 10 (52.6%); married 21 (87.5%); belonged to nuclear family 17 (70.8%); had primary school education 13 (54.2%); belong to low income group 11 (45.8%); belong to self-employed 14 (58.3%); reported their job was physically demanding 13 (54.2%); and working for more than 8 hours 9 (37.5%).

Majority of the patients in the control group were in the age group of above 56 years 13 (54.2%); belonged to females 10 (52.6%); married 14 (73.7%); belonged to nuclear family 12 (63.2%); had non formal education 10 (52.6%); belong to low income group 12 (63.2%); belong to self-employed 16 (84.2%); reported their job was physically demanding 16 (84.2%); and working for 8 hours 17 (87.5%).

FINDINGS

The major findings of the study were presented under following headings.

Objective 1: To evaluate the blood sugar level before and after taking cinnamon among type II diabetes patients in experimental group

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- There was a significant reduction in FBS after cinnamon administration among type II diabetes patients in experimental group t= 3.5 (p= < .05) which was significant.
- There was a significant reduction in RBS after cinnamon administration among type II diabetes patients in experimental group t = 4.04 (p = < .05)

Objective 2: To compare the mean difference in blood sugar among type II diabetes patients between the experimental and control group.

- There is no significant reduction in FBS in experimental group and control group among type II diabetes patients t = .986 (p = >.05).
- There is no significant reduction in RBS in experimental group and control group among type II diabetes patients t =.-458 (p = >.05).

Objective 3: To test the association between the mean difference in blood sugar and selected factors among type II diabetes patients in experimental group.

- There was no significant association between the mean difference in blood sugar and background factors among type II diabetes patients in experimental group (p = > .05).

DISCUSSSION

The result of the study has been discussed according to the studies objectives.

Finding 1: finding on blood sugar level before and after administering cinnamon among type II diabetes patient in experimental group.

- There was a significant reduction in FBS after cinnamon administration among type II diabetes patients in experimental group t= 3.5 (p= < .05) which was significant.
- There was a significant reduction in RBS after cinnamon administration among type II diabetes patients in experimental group t = 4.04 (p = < .05).

The above findings were supported by the study conducted by Paul Crawford (2009) on effectiveness of cinnamon for lowering blood sugar in patients with type II diabetes mellitus. Results were cinnamon lowered 0.83% compared with usual care alone lowering blood sugar 0.37 %.(p=<.04)

Finding 2: finding on mean difference in blood sugar among type II diabetes patients in experimental group and control group.

- There is no significant reduction in FBS in experimental group and control group among type II diabetes patients t = .986 (p = >.05).
- There is no significant reduction in RBS in experimental group and control group among type II diabetes patients t =.-458 (p = >.05).

The above findings were not supported by the study conducted by Rousses et al (2009) conducted a study on the effect of cinnamon for lowering fasting blood sugar among 22 type II diabetes patients with administration of cinnamon extract (500mg) per day for 12 weeks along with ant diabetic agents and the result shows there was a significant effect on lowering fasting blood sugar.

Finding 3: Finding on association between the mean difference in type II diabetes patients and background variables among the patients in experimental group.

- There was no significant association between the mean difference in blood sugar and background factors among type II diabetes patients in experimental group (p = > .05).

IMPLICATION

The findings of the study have the following implication in nursing

Nursing practice

- Cinnamon powder is an effective measure to reduce blood sugar.
- Cinnamon powder is cost effective.
- Cinnamon powder administration promotes the well-being among diabetes patients.
- Cinnamon can be a augment therapy along with usual care.
- Patients taking cinnamon should monitor their blood sugar level.

Nursing research

- The findings of the study would help to expand the scientific body of professional knowledge upon which further research can be conducted.
- Nurses can implement alternative therapy for diabetes mellitus by using evidenced based practice.
- The study will be a valuable reference for the further research.
- Large scale studies can be conducted.

LIMITATIONS

- Administration of cinnamon was done only for 25days.
- Research as a student investigator was limited.
- Selection of samples was a non random method.
- Attrition rate of patients was beyond the control of the investigator.

RECOMMENDATIONS

The following recommendations on the basis of the present study

- A similar study can be conducted on a large sample.
- A longer period of intervention can be studied for more reliability and effectiveness.

CONCLUSION

It was concluded that six grams of daily adjunct cinnamon in addition to usual care seems to lower the blood sugar in patients with poorly controlled type II diabetes patients. Cinnamon supplementation is likely to be safe and may be offered to patients with FBS 110mg/dl and above and RBS 125mg/dl as a potential means to lower blood sugar.

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APPENDIX – I

LETTER REQUESTING OPENION AND SUGGESTIONS OF EXPERTS FOR

ESTABLISHING CONTENT VALIDITY OF REASEARCH TOOL.

From

30093602
II Year M.Sc (Nursing),
Annai J. K. K Sampoorani Ammal College of Nursing
Komarapalayam,
Namakkal district.

To

Through

The Dean,
Annai J. K. K Sampoorani Ammal College of Nursing
Komarapalayam,
Namakkal district.

Sub: Letter requesting consent to validate the tool.

Respected Sir / Madam,

I, 30093602, II year M. Sc, Nursing student of Medical surgical Nursing(cardio Thoracic) specialty studying in Annai JKK Sampoorani Ammal College of Nursing, Komarapalayam, I have selected the following topic for research "A study to assess the effectiveness of cinnamon for lowering blood sugar among type II diabetes patients in selected primary health centers, Namakkal district." in partial fulfillment of the requirement for the degree of Master of Nursing under The Tamilnadu Dr. M G R Medical University, Chennai

Here I am submitting the tool for your expert opinion with possible suggestions. I humbly request your self to spare your precious time, for which I remain ever grateful to you. It would be very kind of you to return the same undersigned at the earliest.

Thanking you,

Place: Yours faithfully,
Date: (30093602).

APPENDIX - II

CONTENT VALIDITYNCERTIFICATE

I hereby certify that I have validated the tool of 30093602, M.sc (N) ii year student , who is undertaking "A study to assess the effectiveness of cinnamon for lowering blood sugar among type II diabetes patients in selected primary health centers, Namakkal district..

Name of the expert : Signature of the expert

Designation :

Place :

Date :

APPENDIX – III

LIST OF EXPERTS

1. Dr.JEYANTH SAMUEL
   General Physician
   Chennai.

2. Dr.ELANGO
   Physician
   Chennai.

3. Dr. BALACHANDER
   Endocrinologist & Diabetologist
   Erode.

4. Dr.SARAMMA.PP
   Nursing Educator
   Shree Chitra Tirunal
   Trivandrum.

5. Mrs.JESSIE SUDARSANAM
   Professor
   Annai JKK sampoorani ammal college of nursing
   Komarrapalayam.

6. Mrs.SHOBANA
   Assistant Professor
   Annai JKK sampoorani ammal college of nursing
   Komarrapalayam.

APPENDIX - IV

QUESTIONAIRE ON BLOOD SUGAR AMONGTYPE II DIABETES PATIENTS

Code No: _____

SECTION – A: BACKGROUND VARIABLE

Instruction:

This section seeks general information about you. Kindly select the most appropriate answer and place a tick mark (✓) against the same in the given box:

1. State your age (in years)_____
   - a) 40-45 yrs ☐
   - b) 46-50yrs ☐
   - c) 51-55yrs ☐
   - d) >56yrs ☐

2. State your gender
   - a). Male ☐
   - b) Female ☐

3. State your marital status
   - a) Married ☐
   - b) Unmarried ☐
   - c) Divorced ☐
   - d) Widow/Widower ☐

4. State your religion

   a) Hindu ☐

   b) Muslim ☐

   c) Christian ☐

   d) Any other_____(specify) ☐

5. Type of family

   a) Nuclear ☐

   b) Joint ☐

   c) Extended ☐

6. State your Education

   a) Non formal education ☐

   b) Primary / High School ☐

   c) Higher secondary ☐

   d) Graduate and above. ☐

7. Annual income (in rupees)

   a) Economically Weaker section – upto Rs.25, 200 ☐

   b) Low income group – Rs.25,201 to 54,000 ☐

   c) Middle income group – Rs. 54,000 to 90,000 ☐

   d) High income group – Rs. 90,000 and above ☐

8. Occupational status

   a) Employed ☐

   b) Unemployed ☐

   c) Self employed_____(specify) ☐

9. How demanding is your job?

   a) Physically demanding ☐

   b) Psychologically demanding ☐

   c) Both ☐

10. State the working time duration

   a) Less than 8 hours ☐

   b) 8 hours ☐

   c) More than 8 hours ☐

SECTION – B: HEALTH VARIABLES:

Instruction:

This section information is about your health issues, kindly place a (✓) mark against the appropriate response applicable to you. Do not leave any question unanswered.

1. Duration of diabetes mellitus since diagnosed

   a) Less than 1year ☐

   b) 1-2 years ☐

   c) More than 2years ☐

2. State your family history of diabetes mellitus

   a) Yes ☐

   b) No ☐

3. If yes specify the relationship_____

4. Do you have any of the following habits?

   a) Smoking ☐

   b) Alcoholism ☐

   c) Drug addiction ☐

   d) Chewing betel leaves or pan ☐

   e) Nil ☐

5. Medication used and specify the dosage _____

DRUG	DOSE

6. How regular are you in taking treatment for diabetes mellitus

a) Very regular ☐

b) Some times regular ☐

c) Irregular ☐

7. How often do you check your blood sugar level?

a) Once in a week ☐

b) Once in a month ☐

c) Once in a year ☐

d) When necessary only ☐

8. Do you follow diabetic diet strictly?

a) Yes ☐

b) No ☐

9. Dietary habits

a) Vegetarian ☐

b) Non-vegetarian ☐

c) Ova vegetarian ☐

d) Lacto vegetarian ☐

e) Ova-Lacto vegetarian ☐

10. State your sleeping hours

a) Less than 8 hours ☐

b) 8 hours ☐

c) More than 8 hours ☐

11. How regular are you in doing exercises

a) Very regular ☐

b) Some times regular ☐

c) Irregular ☐

d) No exercise ☐

12. Do you follow any of the following exercise ?

a) Walking ☐

b) Jogging ☐

c) Yoga ☐

d) Others ☐

13. Do you practice any of the following regularly as home remedial treatment for reducing blood sugar level?

a) Bitter gourd ☐

b) Fenugreek ☐

c) Mango tree leaves ☐

d) Soaked Almond ☐

e) Tulsi and Neem leaves ☐

f) Turmeric powder & Dried gooseberry powder ☐

g) Amla bitter gourd juice ☐

h) Jamun ☐

i) None of the above. ☐

13. Do any of the following give you mental stress?

a) Work load ☐

b) Husband or Wife ☐

c) Children ☐

d) Co-workers ☐

e) Money ☐

f) Physical health ☐

g) Relatives ☐

h) others ☐

SECTION-C: BLOOD SUGAR ASSESSMENT CHART:

Instruction:

The investigator is to assess and record blood sugar level before and after administration of cinnamon.

WEEK & DATE	SESSION	FASTING BLOOD SUGAR LEVEL In mg/dl	
First Week		Pre- Test	Post- Test
Day 1	Morning [FBS]		
	Evening [RBS]		
Second Week	Morning [FBS]		
Day 8	Evening [RBS]		
Third Week	Morning [FBS]		
Day 15	Evening [RBS]		
Fourth Week	Morning [FBS]		
Day 22	Evening [RBS]		

APPENDIX – V

சர்க்கரை வியாதிக்காரர்களின் இரத்த சர்க்கரை அளவு குறித்த வினா தொகுப்பு

பகுதி : 1 பிண்ணணி விவரம்.

குறியீட்டு எண்:

குறிப்பு:-

இப்பகுதி உங்கள் பிண்ணணி விவரங்களை பற்றி விவரிப்பதாகும். கொடுக்கப்பட்டுள்ள வினாக்களுக்கு மிகவும் பொருந்தக் கூடிய விடையை தேர்வு செய்து, அதற்கு நேராக கொடுக்கப்பட்டுள்ள கட்டத்தில் குறியிடவும்.

1. உங்கள் வயதை குறிப்பிடுக.
   - அ. 40-45 வயது ☐
   - ஆ. 46-50 வயது ☐
   - இ. 51-55 வயது ☐
   - ஈ. 56 வருடங்களுக்கு மேல் ☐
2. உங்கள் பாலினம் என்ன என்பதை குறிப்பிடுக.
   - அ. ஆண் ☐
   - ஆ. பெண் ☐
3. உங்கள் திருமண வாழ்க்கை நிலையை கூறுக.
   - அ. திருமணம் ஆனவர் ☐
   - ஆ. திருமணம் ஆகாதவர் ☐
   - இ. விவாகரத்தானவர் ☐
   - ஈ. விதவை பெண்/ விதவை ஆண் ☐
4. எந்த மதத்தை சேர்ந்தவர் ☐
   - அ. இந்து ☐
   - ஆ. இஸ்லாம் ☐
   - இ. கிறிஸ்தவர் ☐
   - ஈ. பிற மதங்கள் ..... (குறிப்பிடுக) ☐
5. எந்த வகையான குடும்பத்தை சார்ந்தவர் ☐
   - அ. சிறிய குடும்பம் ☐
   - ஆ. கூட்டு குடும்பம் ☐
   - இ. பெரிய குடும்பம் ☐

6. கல்வி தகுதி நிலை

அ. படிக்காதவர் (எழுத மற்றும் படிக்க தெரியாதவர்) ☐

ஆ. படித்தவர் (எழுத மற்றும் படிக்க தெரிந்தவர்) ☐

இ. உயர் நிலை பள்ளி படிப்பு முடித்தவர் ☐

ஈ. மேல் நிலை பள்ளி படிப்பு முடித்தவர் ☐

உ. பட்டப்படிப்பு (அ) அதற்கு மேல் படித்தவர் ☐

7. குடும்பத்தின் ஆண்டு வருமானம் (ரூபாயில்)

அ. வறுமைக் கோட்டிற்கு கீழ் (வருடத்திற்கு ரூ. 25,200) ☐

ஆ. வறுமைக கோட்டிற்கு மேல் குறைவான வருமானம் ☐
(ரூ. 25,201 முதல் ரூ.54,000)

இ நடுத்தர ஆண்டு வருமானம் (ரூ.54,000 முதல்90,000) ☐

ஈ. உயர்நிலை வருமானம் (ரூ.90,000 அதற்கு மேல்) ☐

8. என்ன வேலை செய்கிறீர்கள்

அ. அரசு (அ) தனியார் நிரந்தர பணி ☐

ஆ. வேலை இல்லை ☐

இ. சுய தொழில் ..... (குறிப்பிடுக) ☐

9. உங்கள் வேலையில் அத்தியாவசியமானது எது?

அ. உடல் பலுதிறன் அவசியம் ☐

ஆ. மன பலம் அவசியம் ☐

இ. இரண்டும் ☐

10.நீங்கள் எவ்வளவு நேரம் வேலை செய்கிறீர்கள்?

அ. 8 - மணி நேரத்திற்கு கீழ் ☐

ஆ. 8 - மணி நேரம் ☐

இ. 8 - மணி நேரத்திற்கும் மேல் ☐

8. சர்க்கரை வியாதிக்கான உணவு முறையை சரியாக பின்பற்றுகிறீர்களா?

அ. ஆம் ☐

ஆ. இல்லை ☐

9. உங்கள் உணவு பழக்க முறை பற்றி கூறுக.

அ. சைவ உணவு மட்டும் ☐

ஆ. அசைவ உணவு ☐

இ. சைவம் முட்டையுடன் ☐

ஈ. சைவம் மற்றும் பால்பொருட்கள் ☐

உ. சைவம், பால்பொருட்கள் மற்றும் முட்டை ☐

10.நீங்கள் எவ்வளவு நேரம் தூங்குகிறீர்கள்?

அ. 8 - மணி நேரத்திற்கு குறைவாக ☐

ஆ. 8 - மணி நேரம் ☐

இ. 8 - மணி நேரத்திற்கு மேல் ☐

11. நீங்கள் உடற்பயிற்சி சரியாக செய்கிறீர்களா?

அ. மிக ஒழுங்காக ☐

ஆ. எப்பொழுதாவது ஒழுங்காக ☐

இ. ஒழுங்கற்ற பயிற்சி ☐

ஈ. உடற் பயிற்சி செய்வதில்லை ☐

12. நீங்கள் கீழ்க்காணும் ஏதாவது பயிற்சியை செய்பவரா?

அ. நடை பயிற்சி ☐

ஆ. ஓட்ட பயிற்சி ☐

இ. யோக பயிற்சி ☐

ஈ. வேறு ஏதாவது எனில் ..... (குறிப்பிடுக)

13. உங்கள் இரத்த சர்க்கரை அளவை குறைப்பதற்காக கீழ்கண்ட ஏதாவது வீட்டு வைத்தியமுறையை பின்பற்றுகிறீர்களா?

அ. பாகற்காய் ☐

ஆ. வெர்தயம் ☐

இ. மாவிலை ☐

ஈ. ஊரவைத்த பாதாம் ☐

உ. துளசி மற்றும் வேம்பு இலை ☐

ஊ. மஞ்சள் தூள் மற்றும் காய்ந்த நெல்லிக்கனி பொடி ☐

எ. நெல்லிக்காய் மற்றும் பாகற்காய் சாறு ☐

ஏ. நாவல் பழக் கொட்டை ☐

ஐ. மேற்கண்ட ஏதுமில்லை ☐

14. கீழ்கண்டவற்றுள் ஏதேனும் ஒன்று உங்களுக்கு மன அழுத்தம் ஏற்படுத்துகிறதா?

அ. வேலைபழு ☐

ஆ. கணவன் / மனைவி ☐

இ. குழந்தைகள் ☐

ஈ. உடன் வேலை ஆட்கள் ☐

உ. பணப்பிரச்சனை ☐

ஊ. உங்கள் உடல் நிலை ☐

எ. உறவினர்கள் ☐

பகுதி: 2 உடல் நலக் காரணிகள்

குறிப்பு:-

இப்பகுதி உங்கள் உடல்நிலை பற்றிய விவரங்களை சேகரிப்பதாகும். தகுந்த பதிலை தேர்ந்தெடுத்து அதற்குரிய கட்டத்தில் குறிப்பிடவும. தயவு செய்து அனைத்து வினாக்களுக்கும் விடையளிக்கவும்.

1. சர்க்கரை வியாதி கண்டறியப்பட்டு எத்தனை நாட்கள் ஆகின்றது?
   - அ. ஒரு வருடத்திற்கு கீழ் ☐
   - ஆ. 1 முதல் 2 வருடங்கள் ☐
   - இ. 2 வருடங்களுக்கு மேல் ☐

2. உங்கள் குடும்பத்தில் வேறு யாருக்காவது சர்க்கரை வியாதி உள்ளதா?
   - அ. ஆம் ☐
   - ஆ. இல்லை ☐

3. ஆம் எனில் என்ன உறவு முறை என்பதை குறிப்பிடவும் .....

4. கீழ்கண்ட பழக்க வழக்கங்களில் ஏதாவது பழக்கம் உங்களுக்கு உண்டா?
   - அ. புகைப்பழக்கம் ☐
   - ஆ. குடிப்பழக்கம் ☐
   - இ. போதைப் பொருள் பயன்படுத்துதல் ☐
   - ஈ. மேற்கண்ட ஏதுமில்லை ☐

5. நீங்கள் பயன்படுத்திக் கொண்டிருக்கும் சர்க்கரை வியாதி மருந்துகளின் விவரத்தை கூறுக.

மருந்து	அளவு	நேரம்

6. சர்க்கரை வியாதிக்கான சிகிச்சை எந்த அளவுக்கு சரியாக மேற்கொள்கிறீர்கள்?

அ. மிகவும் சரியாக ☐

ஆ. அவ்வப்பொழுது சரியாக ☐

இ. சரியாக எடுப்பதில்லை ☐

ஈ. சிகிச்சை எடுக்கவில்லை ☐

7. எத்தனை நாட்களுக்கு ஒரு முறை உங்கள் இரத்த சர்க்கரை அளவை சோதிக்கிறீர்கள்?

அ. வாரத் திற்கு ஒருமுறை ☐

ஆ. மாதத்திற்கு ஒருமுறை ☐

இ. வருடத்திற்கு ஒருமுறை ☐

ஈ. தேவையான பொழுது ☐

APPENDIX - VI

PROCEDURE

- Informed consent was obtained from each participant.
- An interview was conducted to collect the background and health factors.\
- Pre-test blood sugar level was checked among experimental and control group, both morning and evening.
- Intervention was given to the experimental group by administering 6grams/day of cinnamon powder for 25 days.
- Regularity of intake was ascertained by the investigator personally.
- Post test blood sugar level was obtained on every 8th, 15th and 22nd day both morning and evening among experimental and control group.

Composition of cinnamon:

Nutritive value of bark is given as under

Moisture - 9.9g	Calcium – 1.6g	Vitamin – 175 IU
Protein – 4.6g	Potassium – 0.4g	Niacin- 1.9 mg
Carbohydrate – 59.5g	Phosphorus – 0.05g	Total ash – 3.5g
Iron – 0.004g	Calorie 355/100gm	
Sodium – 0.01g	Vitamin B1 – 0.14mg	
Fiber – 20.3g	Vitamin B2 – 0.21mg	
Fat – 2.2g	Vitamin C – 39.8 mg	

ABSTRACT

A study on effectiveness of Cinnamon in lowering blood sugar among Type II diabetes patients in selected primary health centre, Namakkal District was done by 30093602 as a partial fulfillment of the requirement of the Master degree of Science in Nursing under the Tamil Nadu Dr.M.G.R. Medical University, Chennai, 2010 - 2011.

The objectives of the study were, To evaluate the blood sugar level before and after taking cinnamon among type II diabetes patients in experimental group, To compare the mean difference in blood sugar among type II diabetes patients between the experimental and control group and To test the association between the mean difference in blood sugar and selected factors among type II diabetes patients.

The research hypothesis were H_1: There will be a significant difference between pre and post test mean blood sugar among type II diabetes patients, H_2: There will be a significant mean difference in the mean difference of blood sugar among type II diabetes patients between the experimental and control group and H_3: There will a significant association between the mean difference in blood sugar and selected factors among type II diabetes patients in experimental group.

An extensive review of literature was organized under the following headings. (1) Studies related to type II diabetes, (2) Studies related to type II diabetes and cinnamon and (3) Studies related to type II diabetes and Complementary and alternative therapy.

The conceptual framework was based on evidenced based practice model. The research design was quasi experimental design, the sample were choosen by purposive sampling technique, 24 in experimental and 19 in control group. the data were collected by interview and observation technique from the type II diabetes patients at Namakkal district. 6grams of Cinnamon was administered along with the breakfast to the experimental group. Data obtained were edited ,organized and analyzed by using SPSS package(version 17).

The finding of the study revealed that there was significant reduction in the blood sugar in experimental group, whereas there was no significant difference in mean difference among experimental and control group. The conclusion of the study was that administration of cinnamon was effective in reducing the blood sugar among type II diabetes patients.